



# timbre

Tailored Improvement of  
Brownfield Regeneration  
in Europe

## Web database with a structured site related inventory of European brownfield

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## **Web database with a structured site related inventory of European brownfield information and data**

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## 1. Introduction

The Timbre project shall overcome existing barriers to brownfield regeneration by developing and providing customised problem- and target-oriented packages of approaches, technologies and tools. As a unique asset, these packages shall deliberately include the cultural and administrative characteristics and their regionally distinctive features. By providing a customisable toolbox specifically addressing the diverse processes that have to be dealt with during the course of a regeneration project, end-users shall be enabled to find best practice based solutions. Improvement of existing means to support brownfield regeneration shall be further accomplished by filling methodological core topics such as intelligent remediation in terms of technological advancements with regard to phytoremediation and partial source removal technologies. The project shall deliver a tailored training and dissemination programme as part of an information centre that will transfer existing and emerging knowledge to the scientific community and end-users.

Within Timbre project, the main objective of Work Package 1 (WP1) is the development of an **Expert System** for the collection, analysis and classification of available literature, databases and other information about approaches, tools, case-studies and best-practices related to brownfield regeneration, as developed in previous international and national projects, initiatives and field applications. The Expert System will be included in the Timbre Tool Suite to be developed in WP7.

The Expert System will include as one of its main components a **web database**, where web-links to the material and information of interest on brownfield regeneration will be collected, stored and made easily searchable by end-users. With the aim of guiding end-users among the variety of available information according to their specific requirements, the Timbre Expert System will also offer a multi-criteria methodology for the evaluation and ranking of the collected information providing end-users with the most suitable instruments for each phase of the brownfield regeneration process. According to end-users specifications, results will thus be tailored to site-specific needs taking the local priorities and requirements into account.

The categories of potential end-users are considered to be quite wide, including all people involved in at least one step of the brownfield regeneration process, such as consultants, remediation technology providers, site owners, representative of local/regional/national authorities, scientific community and researchers, public interest groups etc.

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This web database, enriched with information provided not only by Timbre partners, but also by external stakeholders/experts and end-users, will thus provide access to proven state-of-the-art solutions for brownfield regeneration. As a starting point, the first version of the web database will include data collected by Timbre partners. Then, the web database will be improved and enriched during the entire Timbre project duration through the identification of suitable Timbre stakeholders which will be asked to include in the database all the relevant information they can provide, while the final version of the web database and thus of the Expert System will be a living system which will rely on end-users inputs, updates and evaluations. To this end, it is foreseen that each end-user who wants to include/modify or evaluate the collected information will need to register. Different access rights should be reserved on the basis of specific end-user expertise.

Deliverable D1.1 – “Web database with a structured site related inventory of European brownfield information and data” consists of the **currently available version of the Timbre web database** (August 2012) which can be found at the following internet link (<http://www.dais.unive.it/~timbre/explore.php>) and this **report**. In this document, first the framework developed for the collection of available information on brownfield regeneration processes and thus constituting the structure of the database is illustrated (Chapter 2), and then the main features and functionalities of the database are presented (Chapter 3). Moreover, the **Timbre web database User Manual** is provided in Annex I to this document, reporting instructions for accessing, consulting and uploading new information in the web database.

Future development steps within WP1 will include the development of a **multi-criteria methodology** for the evaluation and ranking of the collected information in order to support the end-users in the selection of the most suitable information/instruments for each phase of the brownfield regeneration process. The final Timbre Expert System (to be released by September 2013 as Deliverable D1.3) will thus be aimed at offering to the end-users a wide collection of materials where they will be guided to find and select the most suitable information and tools for their specific tasks according to regional and site-specific requirements.

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## 2. Timbre web database: features, functionalities and contents

### 2.1 Technical features

The Timbre web database will be a core component of the Timbre Expert System and the Timbre tool suite. The finalised public version will be promoted via a Timbre tool suite landing page to be developed jointly with WPs 1 “Expert System”, 3 “Prioritisation” and 6 “Site assessment” in WP7 “Dissemination & Tool Suite”. Currently the web database is accessible at the following webpage: <http://www.dais.unive.it/~timbre/>. The homepage of the web database is reported in Figure 1.

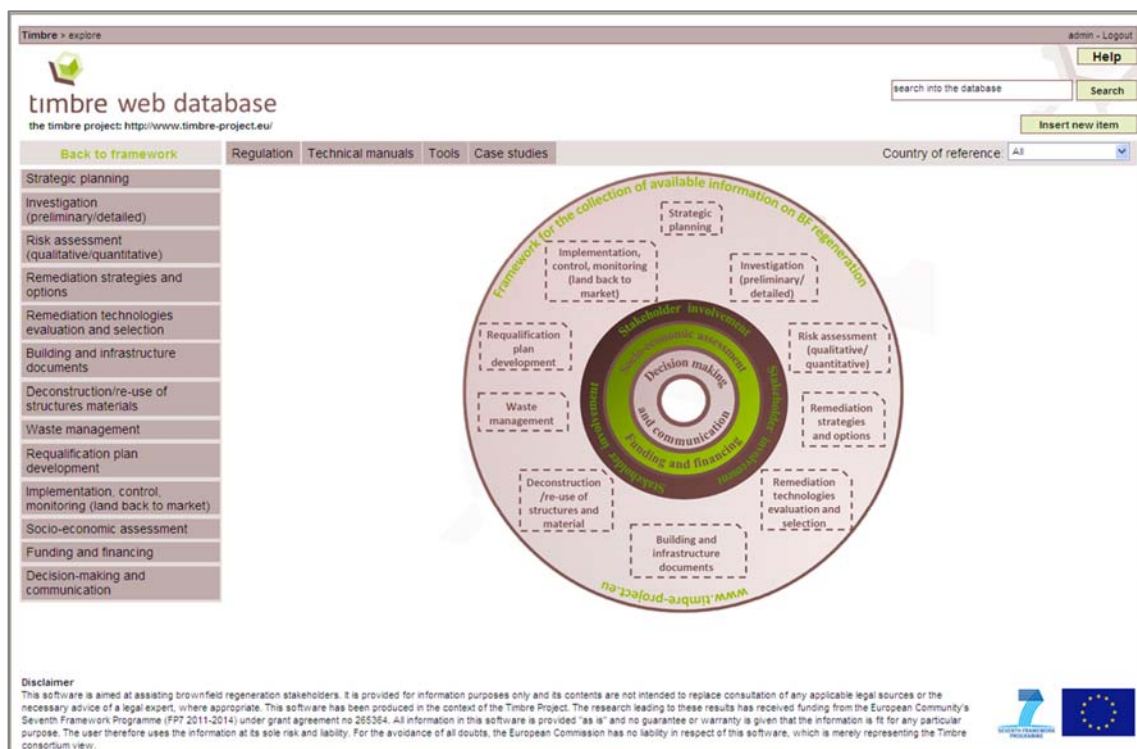


Figure 1. Timbre web database homepage.

For the purpose of this deliverable, a static version with the state-of-development, as of the day of delivery, has been created. Via the following link, the files to create this version of the web database are provided including instructions on how to install the web database in a personal computer: [www.dais.unive.it/~timbre/History/TimbreWebDatabase\\_083112.zip](http://www.dais.unive.it/~timbre/History/TimbreWebDatabase_083112.zip)



To ensure openness and as wide as possible applicability, the Timbre web database is based on LAMP architecture: this acronym refers to a common combination of software used in many web servers, i.e. Linux, Apache, MySQL, and PHP. This is a wide spread, open source web server architecture, which proved to be stable and reliable during the years.

The Timbre database website is indeed hosted in a Linux machine running an Apache web server. Apache HTTP Server, commonly referred to as Apache (<http://httpd.apache.org/>), is the most used web server software, available for a variety of operating system including Unix/Linux and Microsoft Windows. Released under the Apache License, Apache is open-source software.

The website makes use of MySql database server (<http://www.mysql.com/>) for data storage. On the basis of the contents of the MySql database, the generation of the web interface is implemented through Php (<http://www.php.net/>), which is a freely available general-purpose scripting language designed for web development in order to produce dynamic web pages. In other words Php scripts act as an intermediate layer between the MySql database and the presentation of the contents to the user through web pages.

Finally, client-side actions (e.g. forms validation and change of contents without page reload) are provided by means of Javascript functions (<http://www.java.com/it/>) powered by the JQuery package (<http://jquery.com/>), a Javascript library designed to simplify the client-side scripting of HTML.

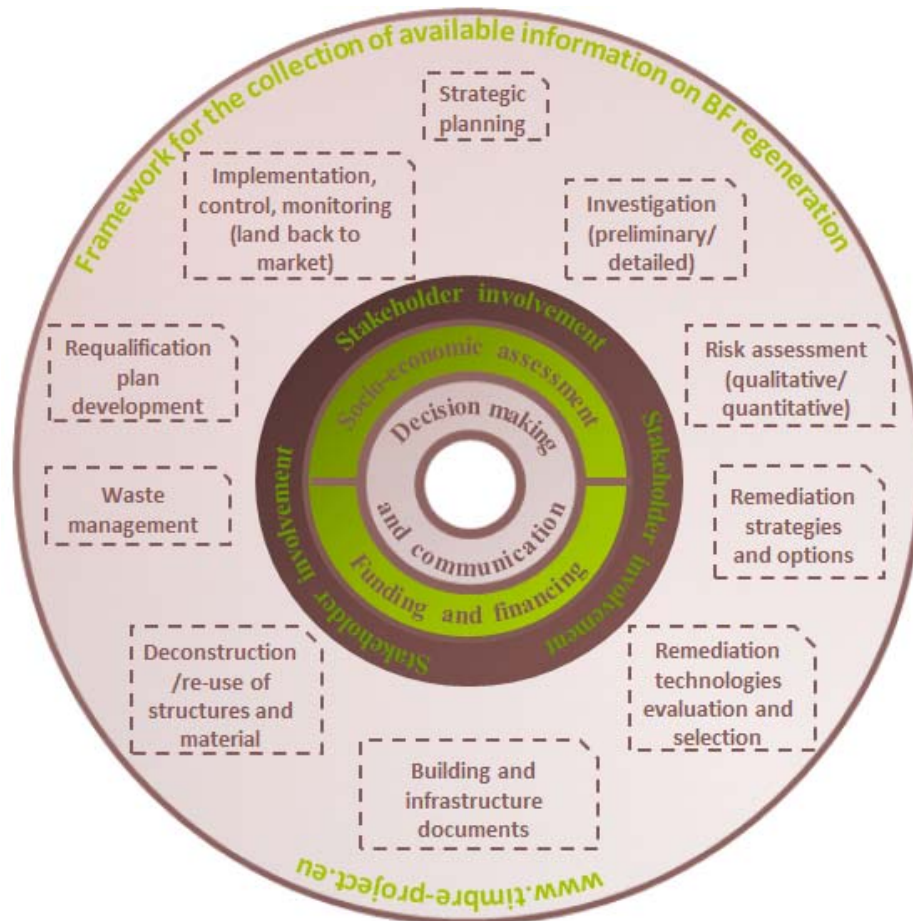
During the development of the web database, anonymous users are not allowed to visualize the web database contents: user login is required to WP1 partners who are asked to upload their materials on the website. Authentication is managed through a list of allowed users which is archived in the MySql database. The list is maintained by the web master, i.e. anonymous users cannot claim for a new login.

In the future, once the web database will be made available to the public, anonymous users will be freely able to visit and search the web database, however a login procedure will be necessary if the user decides to modify the database, i.e. to upload new information. The concrete procedures on the user-interaction with the database are to be discussed and further elaborated also with regard to harmonisation of user requirements also regarding the other Timbre tools to be developed in WPs 3, 6 and 7.

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## 2.2 Web database structure

The structure of the Timbre web database has been developed on the basis of the **framework for the collection of information on brownfield regeneration** (Figure 1) which have been proposed by WP1 partners and discussed/improved by Timbre case-study stakeholders (see WP1 Milestone 11 available on the Timbre website).



**Figure 2. Framework for the collection of available information on brownfield regeneration process.**

In fact, the framework is the result of a significant participatory process in order to reflect best possible user needs and state of the art knowledge. It has first been agreed with WP1 partners, then discussed with all Timbre partners and with the Timbre International Advisory Board. Moreover, local stakeholders involved in Timbre case-studies have been asked to provide their ideas and comments in ad-hocs session during Timbre stakeholder meetings in Hunedoara (Romania) on 11-12 October 2011, in Zielona Góra (Poland) on 28 March 2012, and in Szprotawa (Poland) on 29 March 2012.

Finally, an on-line questionnaire has been administrated to a wide set of external stakeholders/experts from Czech Republic, Germany, Italy, Poland and Romania. 50 questionnaire stakeholders responses out of 180 questionnaire submissions have been collected so far (since July 2012), and their analysis will allow to include further improvements and a final refinement of the proposed framework.

The first draft of the framework on brownfield regeneration included the identified brownfields rehabilitation phases (e.g. characterisation, risk assessment, remediation technologies selection, decision making processes, deconstruction and re-use of existing structures and bulk materials, socio-economic assessment, etc.) as well as some indications about procedural steps and decisional processes (i.e. arrows linking information categories, questions to suggest which would be the following brownfield rehabilitation phase to implement, etc.). However, during the discussions with Timbre partners, the International Advisory Board (IAB) and stakeholders, several comments have highlighted that the decisional structure of the framework diverted the attention of users from its main purpose, i.e. to allow the categorisation of available information on the regeneration of brownfields and to serve as a basis for the development of an expert system, which will support experts and end-users to get access and to rank the previously mentioned information according to their specific needs.

Moreover, during the second project's annual meeting in Venice, IAB members noticed that the application of the web database with such a decisional process, although theoretically correct, would be challenged in practice, due to the differences in national explicit regulation in the different EU countries, which ask for specific regeneration steps to be performed in a predefined order.

According to these comments and suggestions, the final version of the framework **for the collection of information on brownfield regeneration** is composed of a set of "information categories" (boxes and circles in Figure 1) corresponding to different idealised steps of the brownfield regeneration process which are not interconnected and do not represent a decisional structure. The developed framework represents the fundamental structure of the Timbre web database.

In fact, all data/information collected in the database are classified/stored according to the aforementioned "information categories". The users can access the stored information by selecting the "information category" of interest and, if he/she wants to upload in the database new information, this should also be included in one or more of the proposed "information categories".

Then, within each "information category", the records are further subdivided into four classes corresponding to different types of documents/material, namely: "Regulation", "Technical manuals", "Tools" and "Case studies".

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In order to include new records in the database, some information are requested, such as country of reference, application scale, title of the document in English and description with key words in English. In the specific case of the “**Remediation strategies and options**” information category, “**Additional information**” such as technology name, technology type, target contaminants and performance, technology applicability conditions, etc. (see Annex 1, Figure 14) are requested in order to provide to end-users with more specific and detailed technical information on that particular remediation tool/technology. The advantage for end-users and stakeholders to include more specific information also for the other collected tools will be explored and, if appropriate and applicable, the new functionality will be implemented in a future version of the web database.

In the “Case studies” class, site-related information on already redeveloped brownfields and relevant case-study examples reporting site-specific problems, solutions and best practices will be collected. This section is aimed at supporting end-users in finding case-studies with similarities to their own cases and which can thus give useful suggestions to deal with their site-specific problems.

For each “information category” and each type of documents a further filter can be applied according to the country of reference in order to visualise all the information belonging to a specific country of interest. The benefit for end-users and stakeholders to visualise multi-country selections will be explored and, if appropriate, the new functionality will be implemented in a future version of the web database.

Basically, at this stage, the users can perform three types of activity within the web database:

- to search for documents and information (by selecting a specific information category/type of document or by performing a research by keyword);
- to insert new data;
- to modify/delete information that he/she previously included in the web database.

When searching for specific data or when uploading new data, the end-user will need to identify the most appropriate “information category” for getting the wanted information or for classifying correctly his/her new data. To this aim, a description of the “information categories” will be implemented in an up-coming version of the web database. For example, it can be a specific section (e.g. a kind of “glossary”) accessible through the “Help” function by the end-user when needed.

Specific evaluations will be carried out in order to identify how to deal with the identification of inappropriate data/information uploaded by the users within the web database. Options to be assessed concern the opportunity to include, in a future version of the web database, new functions: one could allow users to identify and mark inappropriate data/information and another one could attribute different access rights to end-users according to proven end-user expertise.

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Further details about the use and functionalities of the Timbre web database are provided in Annex I – Timbre web database User Manual. This User Manual will be made available on the database website, where it will be downloadable by users as .pdf file by clicking on the “Help” button.

## **2.3 Web database contents**

The contents of the Timbre web database will be organised according to the structure of the framework presented in Paragraph 2.2. Timbre partners already started to upload in the web database web-links to documents/material about brownfield regeneration, organising them according to the different information categories of the framework.

Information included by Timbre partners should be considered as a starting point for the creation of a wide and comprehensive web database. It is expected that, once the web database can be accessed by the public, end-users’ inputs and up-dating will enrich significantly the database contents, so that this tool will become a “living” system relying on the active participation of an international network of experts and stakeholders. Specific features of the web database for easing the access and the active use by a wide set of end-users will be further discussed and implemented in an up-coming version of the tool.

## **Annex I: Timbre web database User Manual**

Project acronym: timbre  
FP7-ENV-2010.3.1.5-2  
Contract no: 265364  
D1.1 Version 4 | Date: 31/08/2012



# timbre

Project acronym: timbre  
FP7-ENV-2010.3.1.5-2  
Contract no: 265364

Tailored Improvement of  
Brownfield Regeneration  
in Europe

A large, faint, stylized version of the Timbre logo watermark, composed of various shades of brown and tan geometric shapes, is positioned diagonally across the center of the page.

**Timbre web database**

**User Manual**

**Version 0.1 as of 30 August 2012**

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## 1. Introduction

The EU FP7 project Timbre – Tailored Improvement for Brownfield Regeneration in Europe (Contract-No. 265364, <http://www.timbre-project.eu/>) aims to support end-users in overcoming existing barriers in brownfield regeneration by developing and providing customised problem and target-oriented packages of technologies, approaches and management tools for a megasite reuse planning and remediation.

The **Timbre web database** is aimed at storing and making available to a wide set of end-users all the collected information and materials about approaches, tools, case-studies and best-practices related to brownfield regeneration. Specifically, it provides web-links to the specific websites where to download the identified information, documents and tools on brownfield regeneration, together with a set of associated information such as the country of reference, the application scale, etc.

The **web database** is part of the Timbre Expert System, a web-based search engine that will represent an efficient information management tool to support experts and end-users in getting access to all the available information concerning brownfields regeneration processes.

## 2. Timbre web database quick start: registration

In its version 0.1, only registered users can access the Timbre web database. To register for the web database, it is necessary to go to the webpage [http://www.dais.unive.it/~timbre/activate\\_user.php](http://www.dais.unive.it/~timbre/activate_user.php), to insert the e-mail address and to choose a username and a password (Fig. 1).

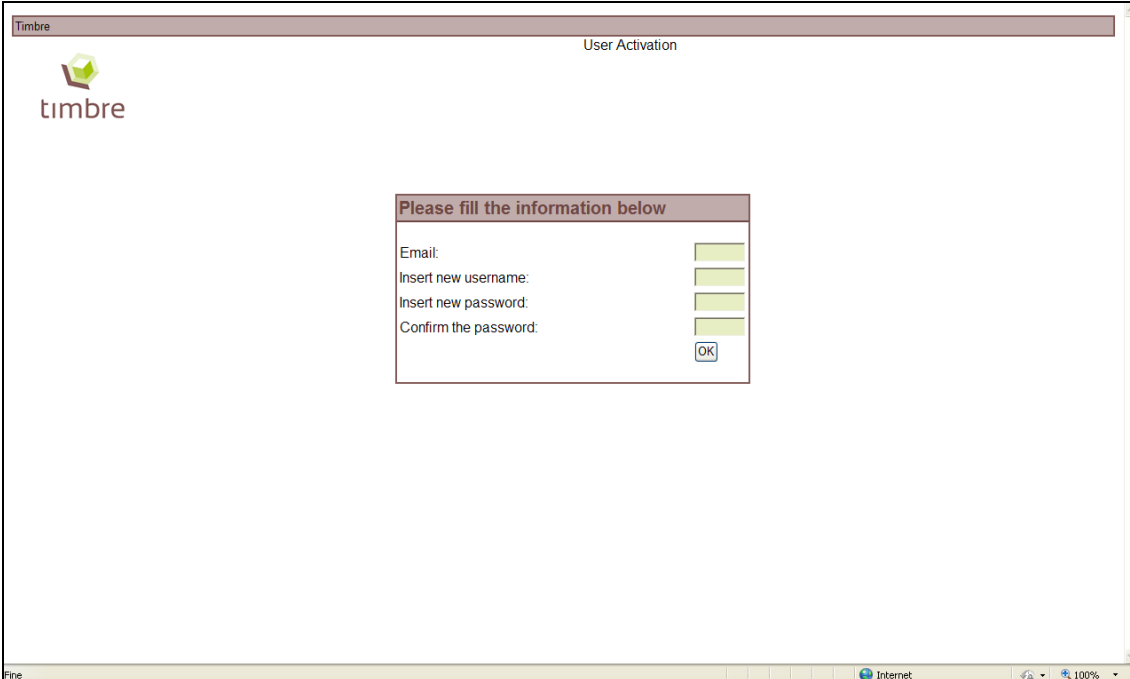


Figure 1. Web database registration page.

Once the registration procedure has been completed, the user can access directly the homepage of the web database.

For accessing the web database as registered user, it is necessary to go the webpage <http://www.dais.unive.it/~timbre/> and to log in with the username and password (Fig. 2).

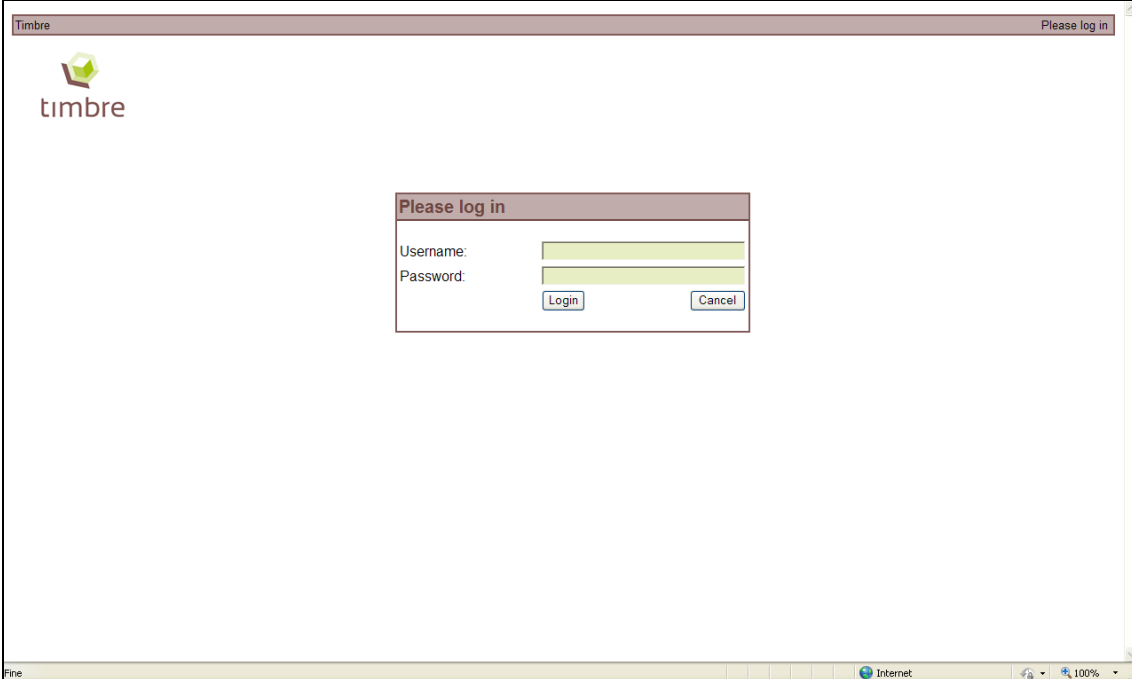


Figure 2. Expert system webpage for registered users.

### 3. How to use the Timbre web database

In this section the procedures to explore the web database, to search for information, to upload new data or to modify it are illustrated.

#### 3.1 Explore the database

After the log in, it is possible to click on the button “Explore the database” (Fig. 3), which allows the user to perform the following actions:

- to search for documents and information;
- to insert new data;
- to modify/delete information that he/she previously included in the web database (i.e. only the information entered by a specific user can be modified/deleted by the same user);

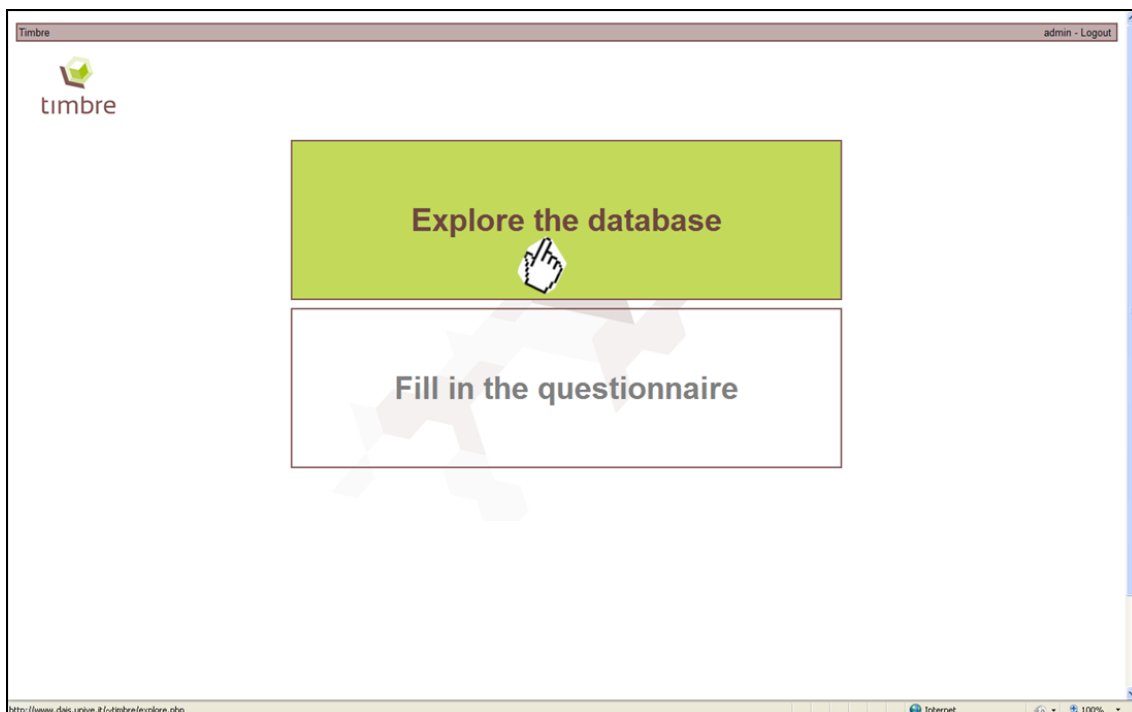


Figure 3. First webpage of the web database.

## 3.2 Search for information

The main scheme for the collection and visualisation of available information is the **Timbre framework** for the collection of available information on brownfield regeneration that can be visualised on the main page of the web database (Fig. 4).

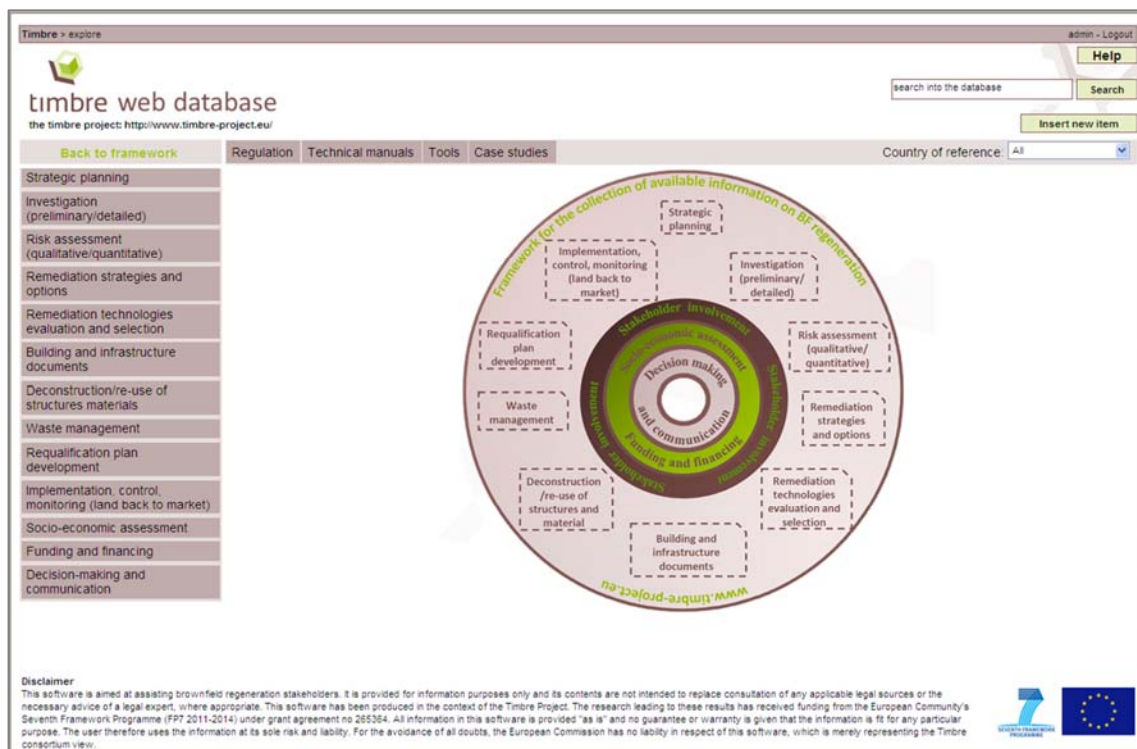


Figure 4. Main page of the Timbre web database.

This framework is composed of a set of “**information categories**” (i.e. the boxes and circles within the framework). The same set of information categories is listed on the left side of the screen in brown boxes.

To search for information among the material included in the web database, the user can click on the different information categories (either in the framework picture or on the left-side list).

Once the information category has been selected, the user can click on the type of documents/materials of interest, choosing among: “Regulation”, “Technical manuals”, “Tools” and “Case studies” (Fig. 5). At this point, the list of available materials related to the selected information category (corresponding to the phase of the brownfield regeneration process) and type of documents is shown.

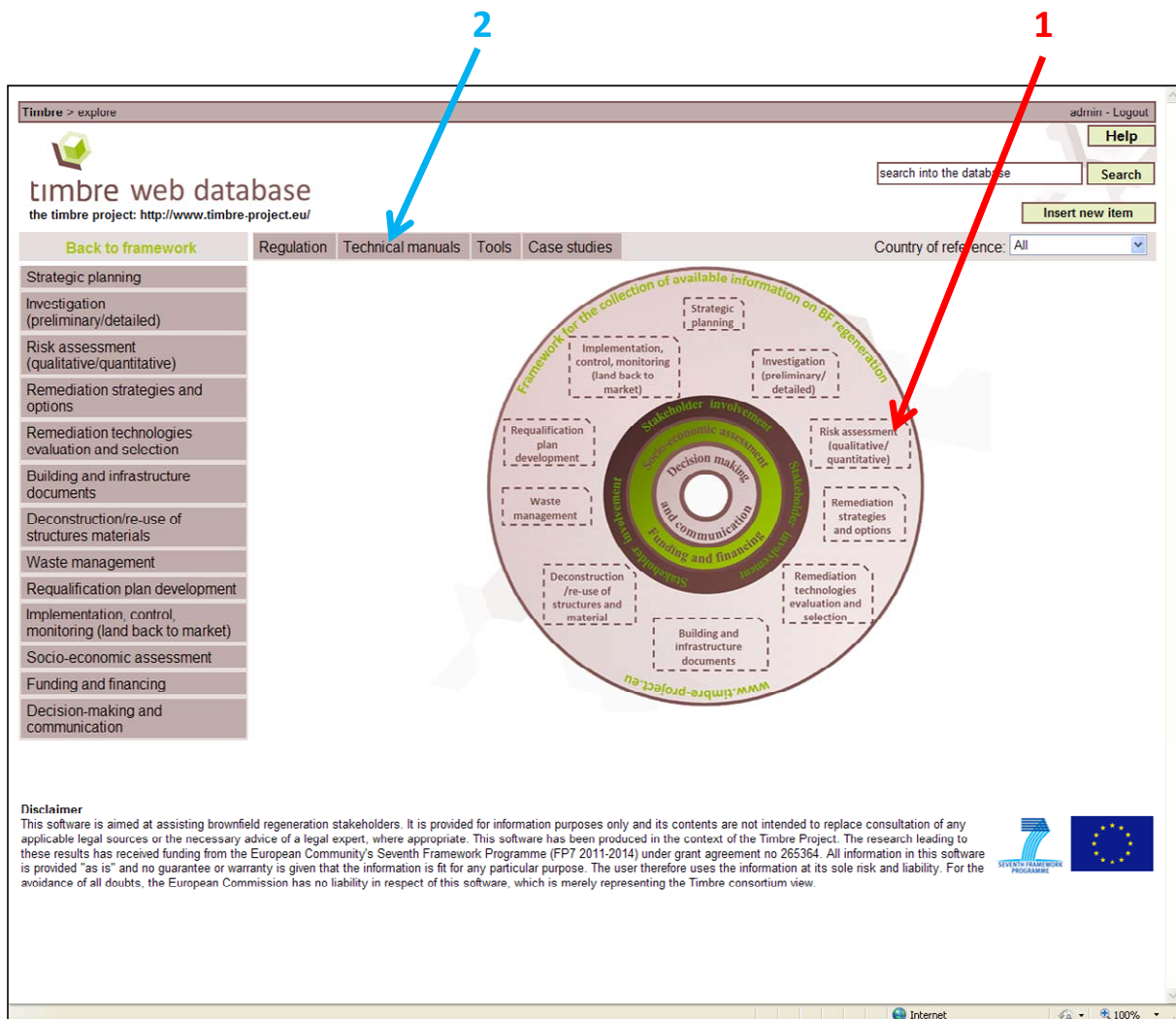
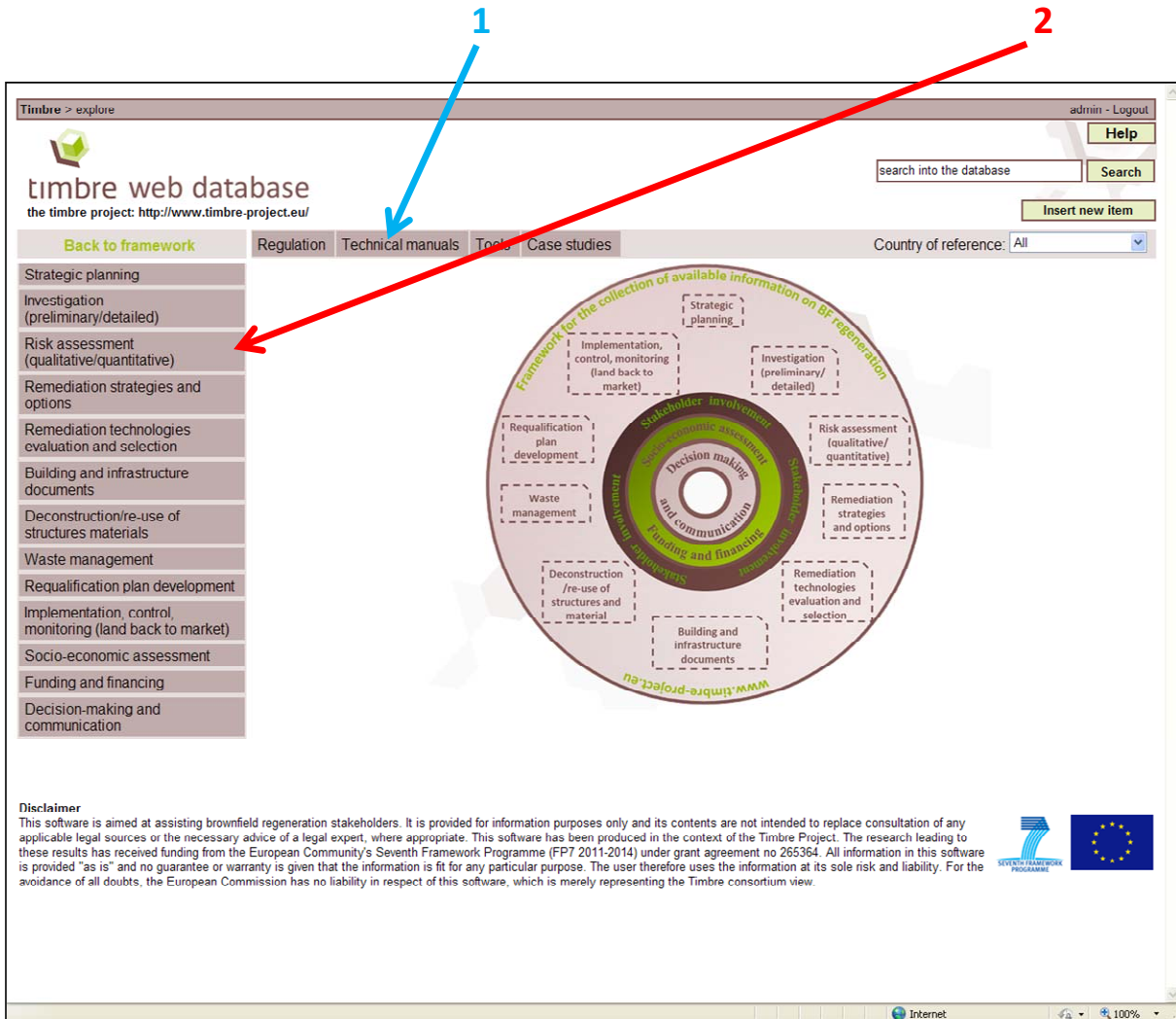


Figure 5. First searching option: 1<sup>st</sup> criterion = information category,  
 2<sup>nd</sup> criterion = type of documents.

In order to search for information it is also possible to click first on the type of documents/materials (i.e., “Regulation”, “Technical manuals”, “Tools” and “Case studies”) and then on the information category of interest in the left-side list (Fig. 6).



The screenshot shows the 'timbre web database' interface. At the top, there's a navigation bar with 'Timbre > explore' and user options like 'admin - Logout' and 'Help'. Below this is a search bar with the text 'search into the database' and a 'Search' button, along with an 'Insert new item' button. The main navigation area includes tabs for 'Regulation', 'Technical manuals', 'Tools', and 'Case studies'. A blue arrow labeled '1' points to the 'Technical manuals' tab. On the left, a sidebar lists various information categories. A red arrow labeled '2' points to 'Risk assessment (qualitative/quantitative)'. The central area features a large circular diagram titled 'Framework for the collection of available information on BF regeneration'. This diagram is divided into concentric rings and segments, including 'Strategic planning', 'Investigation (preliminary/detailed)', 'Risk assessment (qualitative/quantitative)', 'Remediation strategies and options', 'Remediation technologies evaluation and selection', 'Building and infrastructure documents', 'Deconstruction/re-use of structures materials', 'Waste management', 'Requalification plan development', 'Implementation, control, monitoring (land back to market)', 'Socio-economic assessment', 'Funding and financing', and 'Decision-making and communication'. The diagram also mentions 'Stakeholder involvement' and 'Decision making and communication'. At the bottom, there is a disclaimer and logos for the Seventh Framework Programme and the European Union.

Figure 6. Second searching option: 1<sup>st</sup> criterion = type of documents,  
 2<sup>nd</sup> criterion = information category.

After the selection of the information category and the type of documents/material of interest, a page with the list of all available material is displayed, as illustrated in Figure 7.

Timbre > explore > Risk assessment (qualitative/quantitative) - Technical manuals

admin - Logout

Help

search into the database  Search

Insert new item

timbre web database

the timbre project: <http://www.timbre-project.eu/>

Back to framework Regulation Technical manuals Tools Case studies Country of reference: All

Category: Risk assessment (qualitative/quantitative)								
	Subcategory	Country of reference	Application scale	Title of the document (english)	Description of the technical document	Original language link	English Version link	Other languages link
Risk assessment (qualitative/quantitative)				Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Remediation strategies and options	Quantitative	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Remediation technologies evaluation and selection				Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Building and infrastructure documents	Quantitative	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Deconstruction/re-use of structures materials				Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Waste management				Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Requalification plan development	Qualitative and Quantitative	Italy	National	Italian Environmental Protection Agency (ISPRA) Risk assessment technical manuals.	Manuals, methodological criteria, guidelines, protocols, human health toxicological dataset of the Italian Environmental Protection Agency (ISPRA) for environmental risk assessment.	<a href="#">Italian version</a>		
Implementation, control, monitoring (land back to market)				Italian Environmental Protection Agency (ISPRA) Risk assessment technical manuals.	Manuals, methodological criteria, guidelines, protocols, human health toxicological dataset of the Italian Environmental Protection Agency (ISPRA) for environmental risk assessment.	<a href="#">Italian version</a>		
Socio-economic assessment				Italian Environmental Protection Agency (ISPRA) Risk assessment technical manuals.	Manuals, methodological criteria, guidelines, protocols, human health toxicological dataset of the Italian Environmental Protection Agency (ISPRA) for environmental risk assessment.	<a href="#">Italian version</a>		
Funding and financing	Qualitative and Quantitative	Italy	Regional	A.R.G.I.A. Analysis of Risk for the hierarchization of polluted sites of the register.	Regional risk assessment: manual for prioritization of contaminated sites.	<a href="#">Italian version</a>		
Decision-making and communication				A.R.G.I.A. Analysis of Risk for the hierarchization of polluted sites of the register.	Regional risk assessment: manual for prioritization of contaminated sites.	<a href="#">Italian version</a>		
	Quantitative	EU	European	Variation in calculated human exposure.	CLARINET report: comparison of calculations with seven European human exposure models.	<a href="#">English version</a>		

**Disclaimer**

This software is aimed at assisting brownfield regeneration stakeholders. It is provided for information purposes only and its contents are not intended to replace consultation of any applicable legal sources or the necessary advice of a legal expert, where appropriate. This software has been produced in the context of the Timbre Project. The research leading to these results has received funding from the European Community's Seventh Framework Programme (FP7 2011-2014) under grant agreement no 265364. All information in this software is provided "as is" and no guarantee or warranty is given that the information is fit for any particular purpose. The user therefore uses the information at its sole risk and liability. For the avoidance of all doubts, the European Commission has no liability in respect of this software, which is merely representing the Timbre consortium view.






Figure 7. List of selected available material.

In the table (Fig. 7) the user can find, besides all information related to a specific document/material, the **web link** where the document can be downloaded (in the original language and, if available, also in English and in other languages).

The selected information can be also filtered by “Country of reference”. It is possible to select one or more countries by choosing them in the drop-down menu (as shown in Figure 8) before starting the consultation of the database; in this way, when selecting the “information category” and the “type of document”, only documents referred to the selected countries will be visualised.

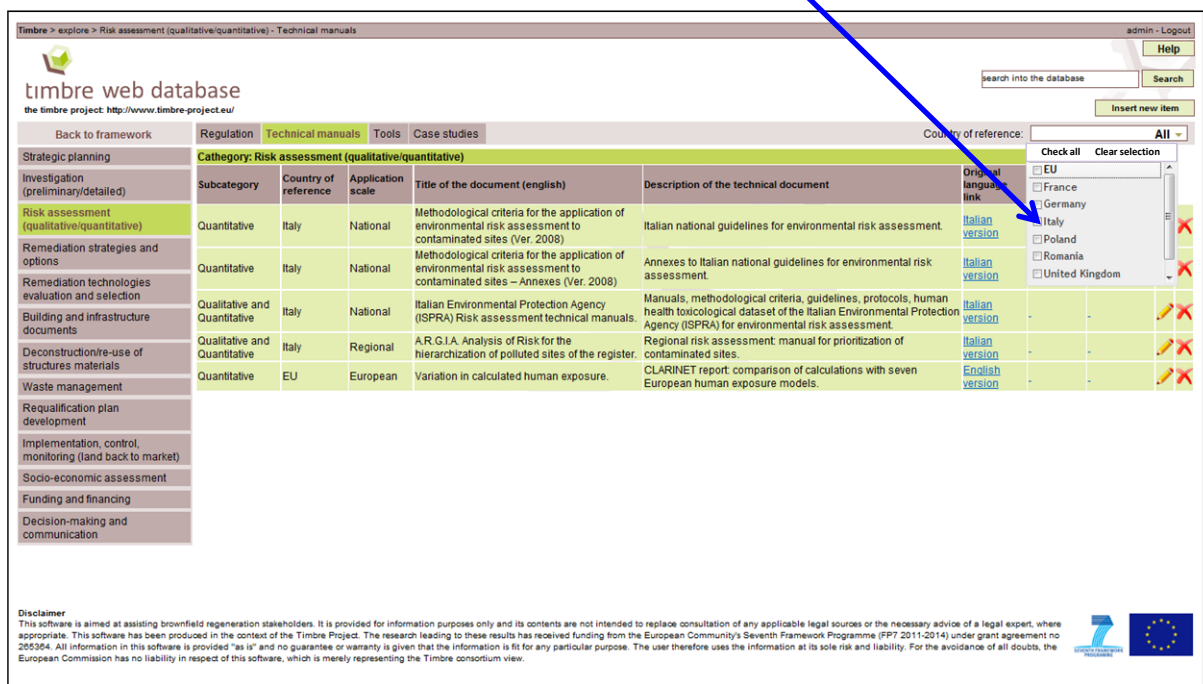
### Select one or more countries by choosing them in the drop-down menu



Figure 8. Selection of the “Country of reference” from the drop-down menu.

Alternatively, it is possible to select first the “information category” and the “type of document” (as explained before, see Fig. 5 and Fig. 6) and then to filter the results by selecting in the drop-down menu the country/ countries of interest, as illustrated in Figure 9.

Select one or more countries by choosing them in the drop-down menu



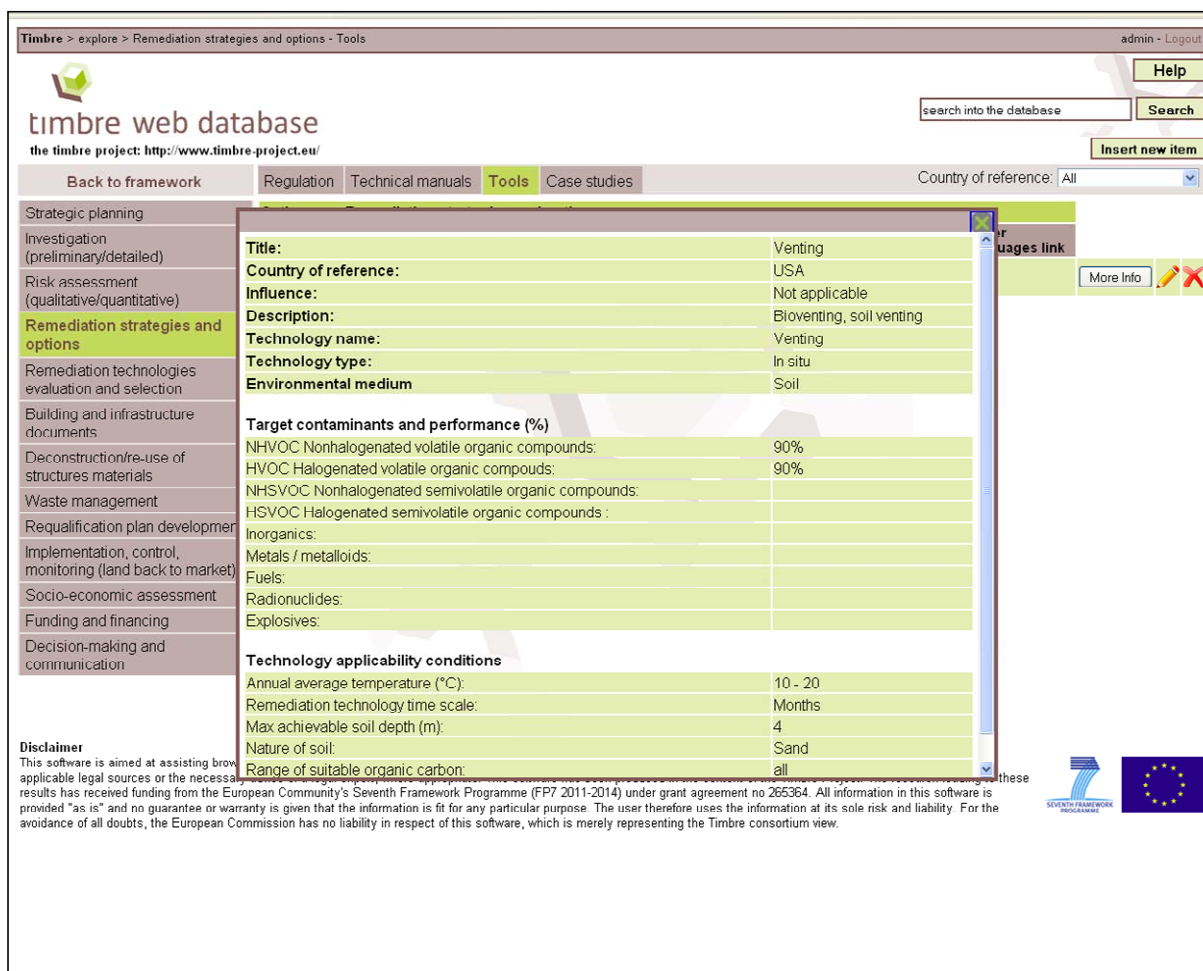
The screenshot shows the 'timbre web database' interface. A blue arrow points to the 'Country of reference' dropdown menu, which is set to 'All'. The dropdown list is open, showing checkboxes for EU, France, Germany, Italy, Poland, Romania, and United Kingdom. The table below displays technical manuals filtered by 'country of reference'.

Strategic planning	Regulation	Technical manuals	Tools	Case studies	Country of reference:
Investigation (preliminary/detailed)	Subcategory	Country of reference	Application scale	Title of the document (english)	Description of the technical document
Risk assessment (qualitative/quantitative)	Quantitative	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Italian national guidelines for environmental risk assessment.
Remediation strategies and options	Quantitative	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites – Annexes (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.
Remediation technologies evaluation and selection	Qualitative and Quantitative	Italy	National	Italian Environmental Protection Agency (ISPRA) Risk assessment technical manuals.	Manuals, methodological criteria, guidelines, protocols, human health toxicological dataset of the Italian Environmental Protection Agency (ISPRA) for environmental risk assessment.
Building and infrastructure documents	Qualitative and Quantitative	Italy	Regional	A.R.G.I.A. Analysis of Risk for the hierarchization of polluted sites of the register.	Regional risk assessment: manual for prioritization of contaminated sites.
Deconstruction/re-use of structures materials	Quantitative	EU	European	Variation in calculated human exposure.	CLARINET report: comparison of calculations with seven European human exposure models.
Waste management					
Requalification plan development					
Implementation, control, monitoring (land back to market)					
Socio-economic assessment					
Funding and financing					
Decision-making and communication					

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Figure 9. Selected information filtered by “country of reference”.

If the selected category of information is “**Remediation strategies and options**” and the selected type of information is “**Tools**”, it will be possible to click the button “**More info**” to gain more specific and detailed information on the selected remediation tool/technology (Fig. 10).



The screenshot shows the Timbre web database interface. The breadcrumb trail is "Timbre > explore > Remediation strategies and options - Tools". The user is logged in as "admin". The page title is "timbre web database" with the URL "http://www.timbre-project.eu/". The navigation menu includes "Back to framework", "Regulation", "Technical manuals", "Tools" (selected), and "Case studies". The "Country of reference" is set to "All". The left sidebar shows a tree view with "Remediation strategies and options" selected. The main content area displays detailed information for a tool:

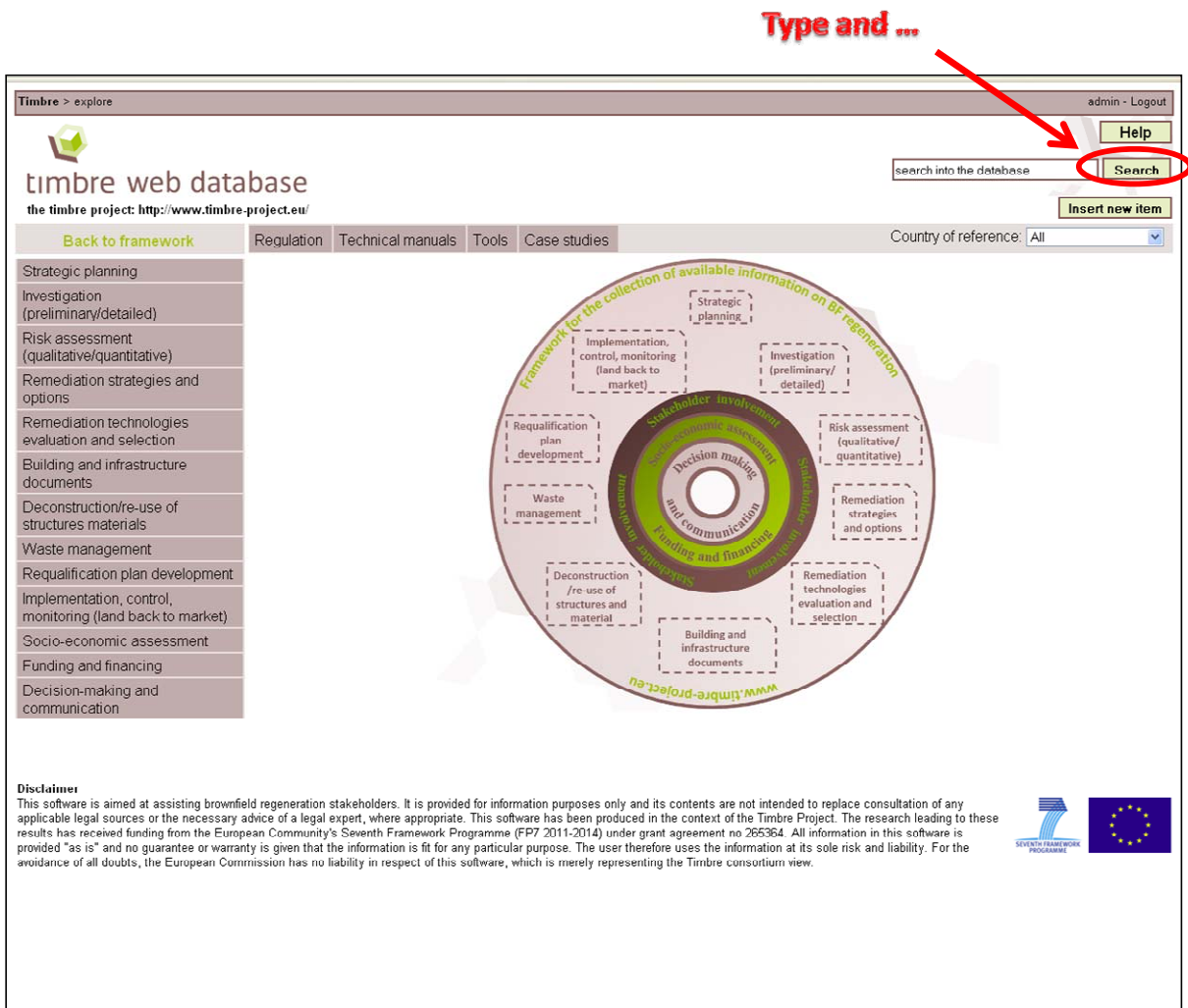
<b>Title:</b>	Venting
<b>Country of reference:</b>	USA
<b>Influence:</b>	Not applicable
<b>Description:</b>	Bioventing, soil venting
<b>Technology name:</b>	Venting
<b>Technology type:</b>	In situ
<b>Environmental medium:</b>	Soil
<b>Target contaminants and performance (%)</b>	
NH VOC Nonhalogenated volatile organic compounds:	90%
HVOC Halogenated volatile organic compounds:	90%
NHS VOC Nonhalogenated semivolatile organic compounds:	
HS VOC Halogenated semivolatile organic compounds:	
Inorganics:	
Metals / metalloids:	
Fuels:	
Radionuclides:	
Explosives:	
<b>Technology applicability conditions</b>	
Annual average temperature (°C):	10 - 20
Remediation technology time scale:	Months
Max achievable soil depth (m):	4
Nature of soil:	Sand
Range of suitable organic carbon:	all

At the bottom left, there is a "Disclaimer" section. At the bottom right, there are logos for the "SEVENTH FRAMEWORK PROGRAMME" and the "European Union".

Figure 10. Specific information collected for the “**Tools**” type of information in the “**Remediation strategies and options**” information category.

Finally, if the user is interested in specific information but he/she is not sure about the information category where it has been stored, he/she can perform a **search by keyword**. To this purpose, it is possible to type the word of interest in the box “**Search into the database**” and then click button “**Search**” to run the research (Fig. 11). The results of the search by keywords are listed with the indication of the information category, where each result is stored (Fig. 12).

**Type and ...**



The screenshot shows the 'timbre web database' interface. At the top, there is a navigation bar with 'Timbre > explore', 'admin - Logout', and a 'Help' button. Below this is a search bar labeled 'search into the database' with a 'Search' button highlighted by a red circle and a red arrow pointing to it from the text 'Type and ...'. To the right of the search bar is an 'Insert new item' button. Below the search bar is a 'Country of reference' dropdown menu set to 'All'. On the left side, there is a 'Back to framework' button and a list of categories: Strategic planning, Investigation (preliminary/detailed), Risk assessment (qualitative/quantitative), Remediation strategies and options, Remediation technologies evaluation and selection, Building and infrastructure documents, Deconstruction/re-use of structures materials, Waste management, Requalification plan development, Implementation, control, monitoring (land back to market), Socio-economic assessment, Funding and financing, and Decision-making and communication. In the center, there is a large circular diagram representing the 'Framework for the collection of available information on BF regeneration'. The diagram is divided into several concentric rings and segments. The outer ring is labeled 'Framework for the collection of available information on BF regeneration'. The inner rings are labeled 'Stakeholder involvement', 'Decision making', 'Funding and financing', and 'Investigation and assessment'. The segments represent various stages of the process: Strategic planning, Investigation (preliminary/detailed), Risk assessment (qualitative/quantitative), Remediation strategies and options, Remediation technologies evaluation and selection, Building and infrastructure documents, Deconstruction /re-use of structures and material, Waste management, Requalification plan development, and Implementation, control, monitoring (land back to market). The URL 'www.timbre-project.eu' is visible at the bottom of the diagram.

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Figure 11. Search by keywords.

Timbre > search > All - All

admin - Logout

Help

groundwater Search

timbre web database

the timbre project: <http://www.timbre-project.eu/>

Back to framework

All Regulation Technical manuals Tools Case studies Found 4 items Country of reference: All

Category: Investigation (preliminary/detailed)

Subcategory	Country of reference	Application scale	Title of the document (english)	Description of the document (english)	Original language link	English Version link	Other languages link
Detailed	Italy	Local	Operative protocol for site's environmental investigation, in accordance with Legislative Decree nr. 152 of 3rd of April 2006 and with the Agreement for chemistry sector of Porto Marghera & Venice.	Protocol/formal guidelines for sites' environmental investigation; characterization requirements and procedure, soil and groundwater samples, soil and groundwater chemical analysis.	<a href="#">Italian version</a>	-	-
Subcategory	Country of reference	Application scale	Title of the document (english)	Description of the technical document	Original language link	English Version link	Other languages link
Preliminary and Detailed	Italy	National	Manual for environmental investigation in contaminated sites.	Italian Environmental Protection Agency manual for soil and groundwater environmental investigation/characterization.	<a href="#">Italian version</a>	-	-
Category: Remediation strategies and options							
Subcategory	Country of reference	Application scale	Title of the document (english)	Description of the technical document	Original language link	English Version link	Other languages link
None	EU	Not applicable	Decision support systems: application in remediation technology evaluation and selection.	DARTS document. Sanja Vranes, E. Gonzalez-Valencia, A. Lodolo and S. Miertus, "Decision support systems: application in remediation technology evaluation and selection", in NATO/CCMS Pilot Study Evaluation of Demonstrated and Emerging Technologies for the Treatment and Clean Up of Contaminated Land and Groundwater, NATO, Wiesbaden, Germany, June 2000, pp. 42-57.	<a href="#">English version</a>	-	-
Category: Remediation technologies evaluation and selection							
Subcategory	Country of reference	Application scale	Title of the document (english)	Description of the technical document	Original language link	English Version link	Other languages link
None	EU	Not applicable	Decision support systems: application in remediation technology evaluation and selection.	DARTS document. Sanja Vranes, E. Gonzalez-Valencia, A. Lodolo and S. Miertus, "Decision support systems: application in remediation technology evaluation and selection", in NATO/CCMS Pilot Study Evaluation of Demonstrated and Emerging Technologies for the Treatment and Clean Up of Contaminated Land and Groundwater, NATO, Wiesbaden, Germany, June 2000, pp. 42-57.	<a href="#">English version</a>	-	-

Figure 12. Page with the results of the search by keywords.

### 3.3 Add new information

Registered users are allowed to upload their own material and information into the web database, categorising them according to the information categories and documents types available in the tool. To this end, the button “Insert new item” is to be used (Fig. 13).

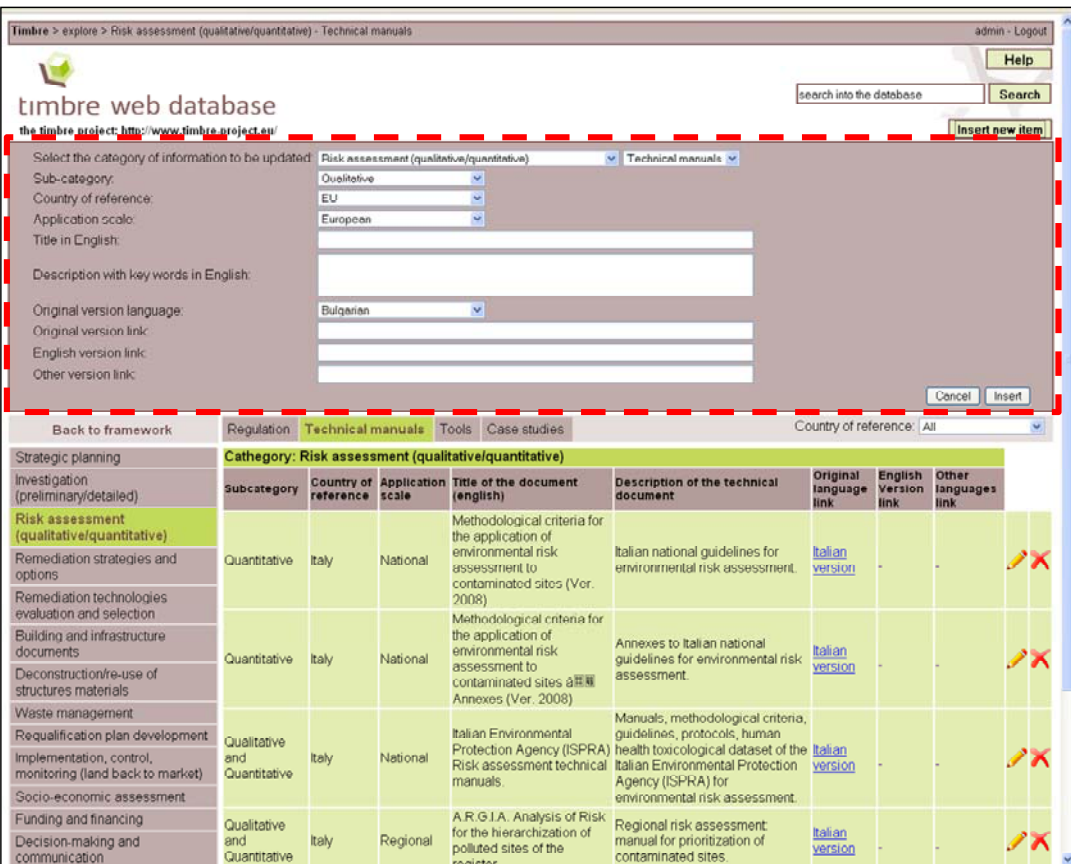
**To add a new e-link**



The screenshot displays the 'timbre web database' interface. At the top, there is a navigation bar with 'Timbre > explore' on the left and 'admin - Logout' on the right. Below this, the 'timbre web database' title is shown along with the URL 'http://www.timbre-project.eu/'. A search bar with the placeholder 'search into the database' and a 'Search' button is present. A red circle highlights the 'Insert new item' button located below the search bar. A blue arrow points from the text 'To add a new e-link' to this button. The main content area features a 'Back to framework' link and a list of categories: Strategic planning, Investigation (preliminary/detailed), Risk assessment (qualitative/quantitative), Remediation strategies and options, Remediation technologies evaluation and selection, Building and infrastructure documents, Deconstruction/re-use of structures materials, Waste management, Requalification plan development, Implementation, control, monitoring (land back to market), Socio-economic assessment, Funding and financing, and Decision-making and communication. A large circular diagram in the center illustrates the 'Framework for the collection of available information on BR regeneration', showing various stages and components. At the bottom, a disclaimer is provided, and logos for the Seventh Framework Programme and the European Union are displayed.

Figure 13. Button to insert new material/documents in the system.

By clicking on the button “Insert new item”, a window for including new information is popping-up as displayed in Fig. 14.



**timbre web database**  
 the timbre project: <http://www.timbre-project.eu/>

Select the category of information to be updated: Risk assessment (qualitative/quantitative) Technical manuals

Sub-category: Qualitative  
 Country of reference: EU  
 Application scale: European  
 Title in English:   
 Description with key words in English:   
 Original version language: Bulgarian  
 Original version link:   
 English version link:   
 Other version link:

Cancel Insert

Back to framework Regulation **Technical manuals** Tools Case studies Country of reference: All

Category: Risk assessment (qualitative/quantitative)	Subcategory	Country of reference	Application scale	Title of the document (english)	Description of the technical document	Original language link	English version link	Other languages link
Risk assessment (qualitative/quantitative)	Quantitative	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>	-	-
Remediation strategies and options	Quantitative	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites 附件 Annexes (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>	-	-
Remediation technologies evaluation and selection	Qualitative and Quantitative	Italy	National	Italian Environmental Protection Agency (ISPRA) Risk assessment technical manuals	Manuals, methodological criteria, guidelines, protocols, human health toxicological dataset of the Italian Environmental Protection Agency (ISPRA) for environmental risk assessment.	<a href="#">Italian version</a>	-	-
Building and infrastructure documents	Qualitative and Quantitative	Italy	Regional	A.R.G.I.A. Analysis of Risk for the hierarchization of polluted sites of the register	Regional risk assessment manual for prioritization of contaminated sites.	<a href="#">Italian version</a>	-	-

Figure 14. Window for entering new information within the database.

In the window reported in Fig. 14, the user is asked to include the following information for each of the document/item he/she wants to add to the web database:

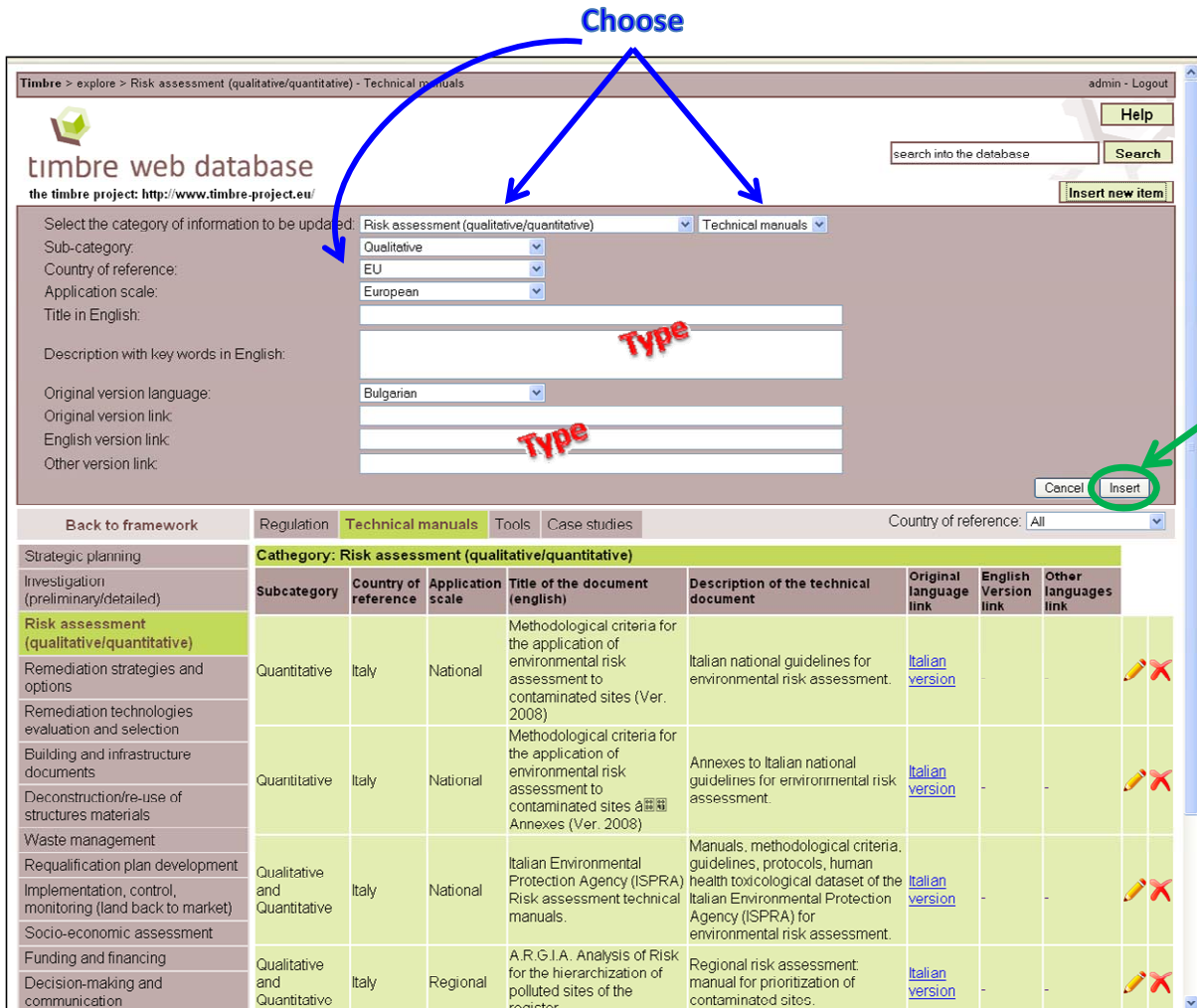
- category of information;
- typology of information;
- sub-category of information (available only for the categories: Investigation and Risk assessment, i.e.: for “Investigation” it is possible to select “Preliminary”, “Detailed” or “Preliminary and Detailed”, while for “Risk assessment” it is possible to select “Qualitative”, Quantitative” or “Qualitative and Quantitative”);
- Country of reference;

- application scale (the following options can be selected: “European”, “National”, “Regional”, “Local” or “Not applicable” according to the applicability of the information/documents/regulations/tools to different contexts);
- title in English;
- description with key words in English;
- original version language;
- original version link;
- English version link (if present);
- other version link (if present).

For some fields (e.g., Country of reference), a list of alternatives is available through a drop-down menu. For other fields (e.g., description with key word in English), the user can type the required information in the windows (Fig. 15).

Once all fields have been filled in, it will be necessary to click “Insert” in order to complete the procedure and upload the information in the web database (Fig. 15).

**Choose**



timbre web database  
 the timbre project: <http://www.timbre-project.eu/>

Select the category of information to be updated: Risk assessment (qualitative/quantitative) Technical manuals

Sub-category: Qualitative

Country of reference: EU

Application scale: European

Title in English:   
Type

Description with key words in English:   
Type

Original version language: Bulgarian

Original version link:   
Type

English version link:   
Type

Other version link:   
Type

Cancel Insert

Back to framework Regulation **Technical manuals** Tools Case studies Country of reference: All

	Subcategory	Country of reference	Application scale	Title of the document (english)	Description of the technical document	Original language link	English Version link	Other languages link
<b>Category: Risk assessment (qualitative/quantitative)</b>								
Risk assessment (qualitative/quantitative)	Quantitative	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Remediation strategies and options	Quantitative	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites Annexes (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Remediation technologies evaluation and selection	Quantitative	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites Annexes (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Building and infrastructure documents	Quantitative	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites Annexes (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Deconstruction/re-use of structures materials	Quantitative	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites Annexes (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Waste management	Quantitative	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites Annexes (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Requalification plan development	Qualitative and Quantitative	Italy	National	Italian Environmental Protection Agency (ISPRA) Risk assessment technical manuals.	Manuals, methodological criteria, guidelines, protocols, human health toxicological dataset of the Italian Environmental Protection Agency (ISPRA) for environmental risk assessment.	<a href="#">Italian version</a>		
Implementation, control, monitoring (land back to market)	Qualitative and Quantitative	Italy	National	Italian Environmental Protection Agency (ISPRA) Risk assessment technical manuals.	Manuals, methodological criteria, guidelines, protocols, human health toxicological dataset of the Italian Environmental Protection Agency (ISPRA) for environmental risk assessment.	<a href="#">Italian version</a>		
Socio-economic assessment	Qualitative and Quantitative	Italy	National	Italian Environmental Protection Agency (ISPRA) Risk assessment technical manuals.	Manuals, methodological criteria, guidelines, protocols, human health toxicological dataset of the Italian Environmental Protection Agency (ISPRA) for environmental risk assessment.	<a href="#">Italian version</a>		
Funding and financing	Qualitative and Quantitative	Italy	Regional	A.R.G.I.A. Analysis of Risk for the hierarchization of polluted sites of the register	Regional risk assessment manual for prioritization of contaminated sites.	<a href="#">Italian version</a>		
Decision-making and communication	Qualitative and Quantitative	Italy	Regional	A.R.G.I.A. Analysis of Risk for the hierarchization of polluted sites of the register	Regional risk assessment manual for prioritization of contaminated sites.	<a href="#">Italian version</a>		

Figure 15. Window for entering new information within the database with the different input options.

If the internet link is referred to a tool/technology of the category of information “**Remediation strategies and options**”, it will be necessary to add “**Additional information**” in order to provide to end-users with more specific and detailed technical information on that particular remediation tool/technology.

In Figure 16, the set of additional information required by the web database is displayed. Also in this case, at the end of the process it will be necessary to click “Insert” in order to complete the procedure and upload the information in the web database.

Original service link:  
Original service link:  
English service link:  
Other service link:  
**Additional Information**

Figure 16. Additional information required for inserting a tool/technology in the category of information “**Remediation strategies and options**”.

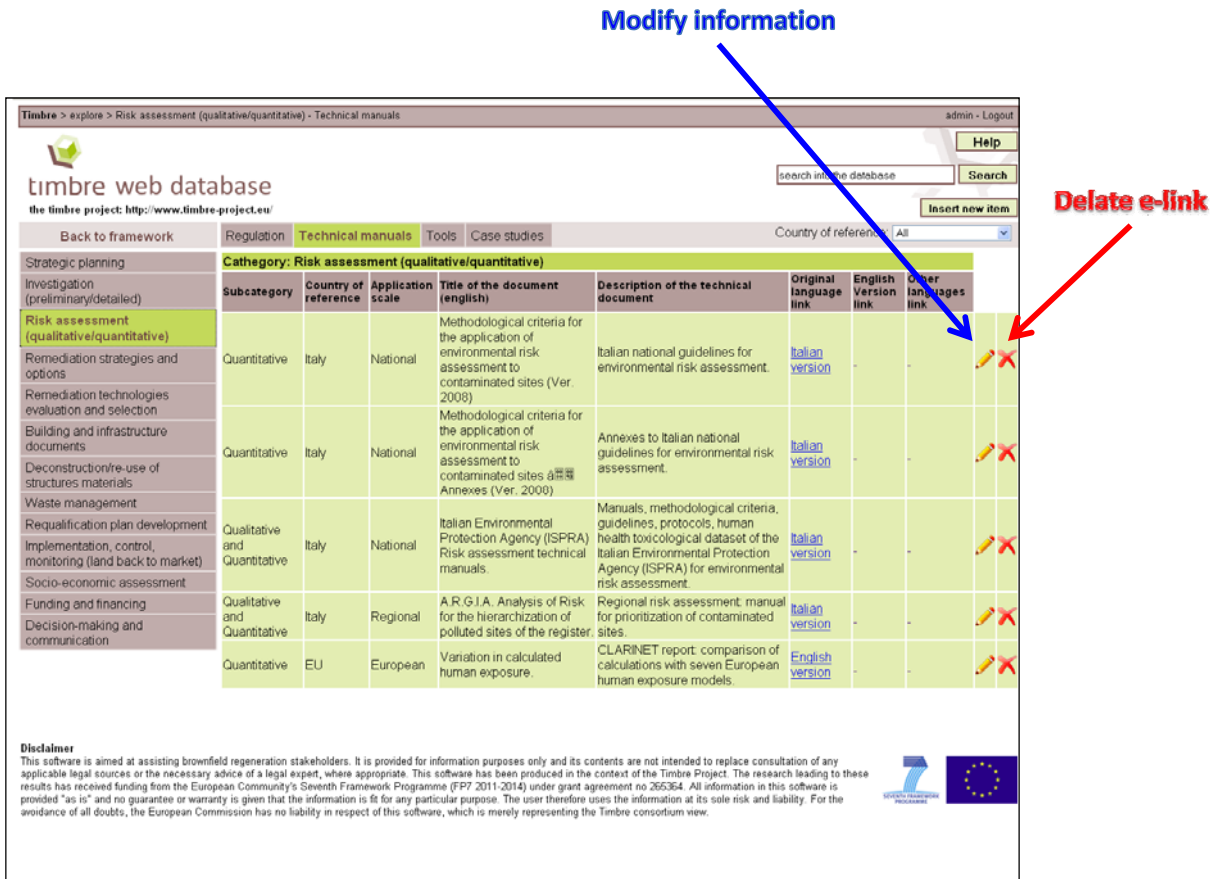
### 3.4 Modify/delete information

If the user decides to modify some details referred to the internet links already inserted into the web database, it is possible to use the icon “pencil” on the right side of the record line (Fig. 17).

If, instead, it is necessary to delete an internet link with the associated information, it is possible to click on the “red cross” on the right side to erase the link from the list of e-links (Fig. 17).

**Modify information**

**Delete e-link**



The screenshot shows the 'timbre web database' interface. At the top, there's a navigation bar with 'Back to framework', 'Regulation', 'Technical manuals', 'Tools', and 'Case studies'. Below this is a table with columns: 'Subcategory', 'Country of reference', 'Application scale', 'Title of the document (english)', 'Description of the technical document', 'Original language link', 'English Version link', and 'Other languages link'. The table lists several documents related to risk assessment and remediation. A blue arrow labeled 'Modify information' points to the pencil icon in the 'Other languages link' column for the first row. A red arrow labeled 'Delete e-link' points to the red cross icon in the same column for the second row.

Subcategory	Country of reference	Application scale	Title of the document (english)	Description of the technical document	Original language link	English Version link	Other languages link
Risk assessment (qualitative/quantitative)	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Remediation strategies and options	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Remediation technologies evaluation and selection	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Building and infrastructure documents	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Deconstruction/re-use of structures materials	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Waste management	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Requalification plan development	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Implementation, control, monitoring (land back to market)	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Socio-economic assessment	Italy	Regional	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Funding and financing	Italy	Regional	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
Decision-making and communication	Italy	Regional	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>		
	EU	European	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">English version</a>		

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Figure 17. Icons to modify and delete information.

### 3.5 Help

If the user needs information about how to consult the web database and how to upload new data, he/she can click on the button „Help” in the top corner of the screen (Fig. 18). By clicking on this button, the present „User Manual” will be downloaded as a pdf file. A more interactive and user-friendly version of the „User Manual” is under development and will be implemented in a future version of the web database.

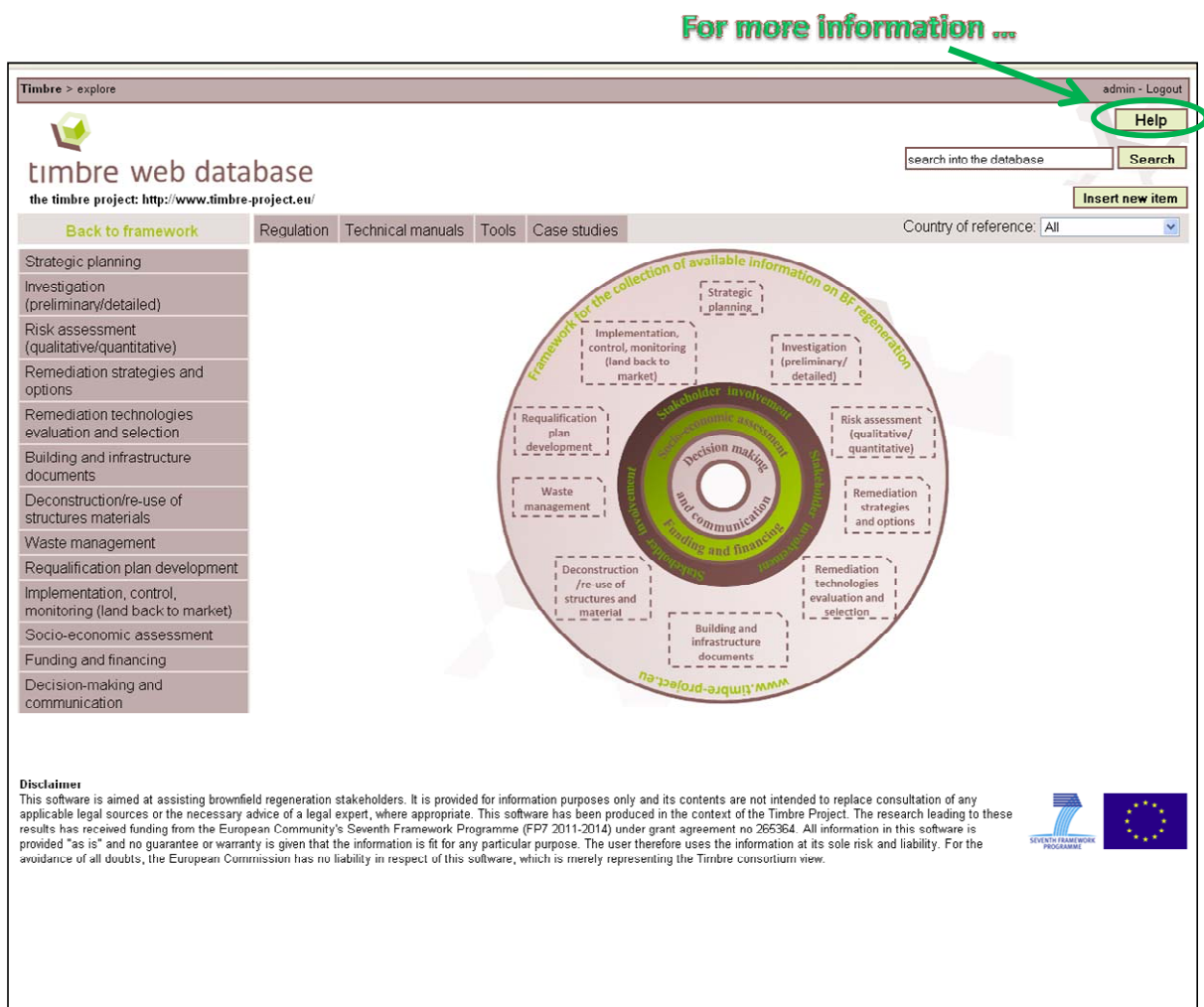
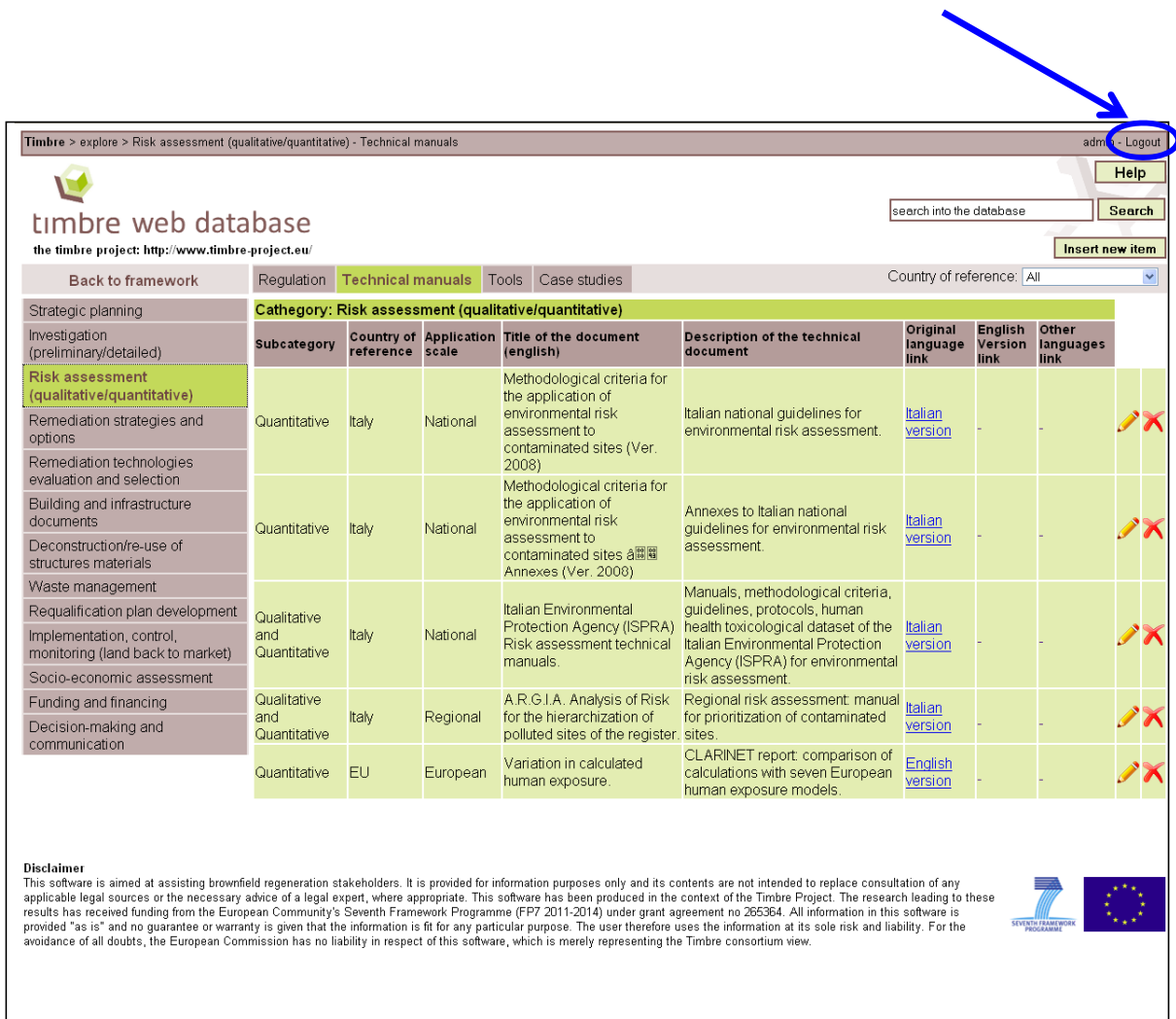


Figure 18. “Help” button.

### 3.6 Log out

For security reasons, when the user decides to leave the Timbre web database, he/she has to click on the “Logout” button on the top right corner of the screen (on the brown bar) (Fig. 19).



The screenshot shows the Timbre web database interface. At the top right, in the brown navigation bar, there is a 'Logout' button circled in blue, with a blue arrow pointing to it from above. The interface includes a search bar, a 'Help' button, and a 'Country of reference' dropdown menu. The main content area displays a table of technical manuals under the category 'Risk assessment (qualitative/quantitative)'. The table has columns for Subcategory, Country of reference, Application scale, Title of the document (english), Description of the technical document, Original language link, English version link, and Other languages link. The table lists several documents, including 'Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)' and 'Annexes to Italian national guidelines for environmental risk assessment'.

Subcategory	Country of reference	Application scale	Title of the document (english)	Description of the technical document	Original language link	English version link	Other languages link
Risk assessment (qualitative/quantitative)	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>	-	-
Remediation strategies and options	Italy	National	Methodological criteria for the application of environmental risk assessment to contaminated sites (Ver. 2008)	Annexes to Italian national guidelines for environmental risk assessment.	<a href="#">Italian version</a>	-	-
Remediation technologies evaluation and selection	Italy	National	Italian Environmental Protection Agency (ISPRA) Risk assessment technical manuals.	Manuals, methodological criteria, guidelines, protocols, human health toxicological dataset of the Italian Environmental Protection Agency (ISPRA) for environmental risk assessment.	<a href="#">Italian version</a>	-	-
Building and infrastructure documents	Italy	Regional	A.R.G.I.A. Analysis of Risk for the hierarchization of polluted sites of the register.	Regional risk assessment: manual for prioritization of contaminated sites.	<a href="#">Italian version</a>	-	-
Deconstruction/re-use of structures materials	EU	European	Variation in calculated human exposure.	CLARINET report: comparison of calculations with seven European human exposure models.	<a href="#">English version</a>	-	-

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Figure 19. Log out button.

## Annex II: Contributors to the report and Disclaimer

### Contributors

This report is the result of discussions between all partners of the Timbre Work Package 1. It has been authored by Lisa Pizzol, Elisa Giubilato, Erika Rizzo, Alex Zabeo, Luca Cosmo, Andrea Critto, Antonio Marcomini (UNIVE) and edited by Stephan Bartke (UFZ).

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